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## NOTES ON THE *SCIURIDÆ*.

By J. L. BONHOTE, M.A., F.Z.S.

(PLATE I.)

IN a civilized and thickly populated country, the first of the wild native fauna to fall before the superior advance of man are the larger mammals; and, although in many cases man has been the loser by the wantonness of his slaughter, yet as a rule, such destruction having been for the general benefit of the human race, one has perforce to lay aside one's sentimental desires and accept the inevitable. Among the smaller mammals, however, no such tale of slaughter exists, and Rats and Mice maintain their existence under the very roofs of man, who is practically powerless to diminish their numbers. That the abundance of these latter is in part due to the scarcity of the larger mammals is to a great extent true; but as my object is not to discuss the protection or otherwise of mammals, let us turn to the one group which does comparatively little harm, and to the species which, although of diurnal and conspicuous habits, still remains in numbers to enliven our woods and forests—the Squirrel (*Sciurus vulgaris*).

The Squirrel, as most people know, is a rodent of arboreal habits; in shape and size it much resembles a Rat, but its feet are longer and more plastic, enabling it to grasp with greater ease the trees on which it lives. The front feet have only four

toes, the thumb being a mere stump, which is much used for holding the nuts while they are being cracked. The tail, which is large and bushy, serves the double purpose of balancing the body whilst leaping through the air, keeping it dry by being folded over its back, and enabling the animal to keep warm when curled around it.

Squirrels are widely dispersed throughout the world, being absent alone from Australia and Madagascar. In the Palæarctic Region, which stretches from England to Japan, only one species is known, although individuals from various localities are constant to themselves, and slightly different from their neighbours. It is, however, in the Indian and Oriental region that the species reaches its maximum development, and the number of species recorded from that region is very large. Putting aside for the moment the question of species, subspecies, races, varieties, &c., and looking as far as possible at the groups as a whole, we find that they give us such abundant opportunities for the study of colour in nature, and the causes by which it is influenced, that they can but form a valuable lesson to the zoologist, whatever may be his particular line.

I will preface my remarks by saying at the outset that our knowledge on the subject is very limited, and that at present we are in the position of only recording facts, which, however, may at some future time bear considerable fruit. In the first place, there is the colour of the animals, which, in the case of our English Squirrel, may be roughly called red.\* This colour is modified during the course of the year† by two moults, in spring and autumn, the change taking place in May and October. In its winter dress it is greyish brown in colour, the hairs being long and soft, the tail is of a similar colour, and the ears are also clothed with long brown hairs; in May all the body-hairs are cast, and are replaced by shorter and coarser hairs of a much redder colour, while the tufts on the ears are not replaced. The hairs of the tail are not moulted at the spring moult. This may seem to be only the natural course of things to an ornithologist, but a moment's thought will at once show us that the causes

\* For actual descriptions of various European forms, see G. E. H. Barrett-Hamilton, P. Z. S., 1899, p. 8.

† See O. Thomas, Zool. 1896, p. 401.



must be very different. The tail as a balancer must be as much required in summer as in winter, if not more so; but, on the other hand, the tail as a warm covering is not so necessary, and hence probably the reason of its not being renewed. There is, however, a further noticeable point about this tail, which is fully dealt with by Mr. Thomas in the article quoted above, and that is, that as it gets older it becomes lighter in colour, till by autumn it is nearly white. Mr. Thomas further points out that the red hairs of summer show no tendency to this bleaching process, whilst the brown winter hairs slowly bleach throughout the time they are worn, but, being replaced in spring, the process is never so conspicuous on the body as on the tail, where the change goes on throughout the year.

Although we are accustomed to see fur and feathers of all kinds "bleach" under the action of light, we are perhaps too much inclined to take it for granted that the bleaching action on a living animal goes on by the same process. This may be true of a bird's feather, which is considered histologically dead, yet it is hardly conceivable in a mammalian hair, which maintains throughout its life an active connection with the body; and, bearing this in mind, one may notice that the bleaching, which, if the tail were dead, one would expect to go on uniformly, starts at the tip, and gradually spreads downwards towards its base, thereby, to my mind, clearly showing that, although this lightening may, and probably does, take place by a merely mechanical process, yet such a process cannot act on the normal living hair. I may be perhaps allowed to mention on this matter, that when bleaching goes on among birds that bleaching process does not begin and continue slowly throughout the life of any particular feather, but a feather which may show hardly any change during the first six months of its life will suddenly undergo considerable disintegration and bleaching on the seventh. Does it not seem as though vital forces existed in that feather during the earlier part of its life? Taking our remarks on bleaching into a rather wider field, we find that this "fading" is restricted either to certain races, or to certain parts of the animals—for instance, among the large and closely allied Squirrels of the *Ratufa bicolor* group, as I have already shown in a previous paper,\* which inhabit the

\* Ann. and Mag. Nat. Hist. ser. vii. vol. v. p. 490 (1900).

Malay Peninsula and Borneo. This bleaching is entirely absent in a large form (*R. gigantea*), while being present and a very conspicuous feature in the very closely allied form (*R. bicolor*), although chiefly confined to the body.

In *R. affinis* (another species) it is general and uniform both on the body and the limbs, and in *R. ephippium* is almost entirely absent, or, if present, confined, as in the case of the European Squirrel, to the tail only.

To account for changes of this kind as being due merely to the bleaching or wearing of the hairs seems to me hardly a sufficient explanation, for if that were the sole cause there would be no reason why one portion of the animal should bleach more than another. It might be accounted for in some cases, as Mr. Thomas has pointed out in our European Squirrel, by the absence of a moult; but such a solution would hardly hold good in the case of *R. bicolor*, where the line of demarcation is irregular, and varies in individuals; or again, in the case of *R. affinis*, where the bleaching, which is general, follows so quickly on the growth of the new pelage that hardly any specimens in unbleached pelage are known in our museums.

It seems to me that the only way to account for these phenomena is to suppose that these hairs must sever their physiological connection with the body, and that, when disconnected, the destructive action of light and weather is able to act; but to thoroughly elucidate this matter microscopical examination of fresh specimens is necessary. My object in this paper is merely to draw attention to the facts.

Apart from this seasonal change by bleaching, there are two other forms of seasonal pelages to be observed. The one, which may be noticed on *S. berdinoni*, and doubtless many other forms, in which the pelage worn in summer is a much brighter and more intense edition of that worn during the colder portions of the year. Whether the change takes place by abrasion or by moult, I am unable to say—possibly the former, as the dark lateral stripes can be clearly distinguished in the winter pelage, but very much concealed owing to each hair having a dark brown tip. The other seasonal pelage is that in which the brightest phase takes place in winter, and, instead of being a brighter edition of the duller pelage, is markedly distinct. The only two



examples of this pelage with which I am acquainted are *Sciurus caniceps* and *S. atrodorsalis*. During the greater part of the year these forms wear a dull grey dress, but in the winter months (from December to February) both sexes assume on the back, by moult, a much more brilliant pelage, which in the case of the former is deep orange, and in the case of the latter a glossy black. It is supposed that the assumption of this dress coincides with the pairing season, but I am not aware that this has been actually proved.

Let us now turn again to our European Squirrel. Many depredations on young trees and birds are laid to his account, and I fear it must be acknowledged these accusations are to some extent true. He is in the main, however, a vegetable feeder, living chiefly on beech-mast and acorns, but little in the way of seeds comes amiss to him; and when in the fir-woods the cones are found very much gnawed by his strong and sharp teeth. With one I had in captivity, whose chief food used to be hazel-nuts, the method of eating them was always the same. The nut would be held by the large end, so that the long axis of the narrow portion was transverse to the mouth, when an incision would be made until there was a hole large enough for the insertion of the incisors between the shell and kernel. Into this hole the lower incisors would be placed, and a piece of the shell broken off by a sharp twist of the head; similar actions would be repeated until the whole of the shell was broken off, and then the kernel would be devoured.

Although, as I have said, their food is chiefly, if not entirely, vegetable, my tame one would frequently use his teeth on the furniture, boots, or anything handy, apparently from mere wanton destruction, and when offered fresh twigs with any bark on would invariably strip them of the bark, although it did not appear to be eaten.

In England pairing takes place early in April, and the young are born about midsummer in large nests or "dreys," composed of sticks, on which is collected a large mass of moss neatly hollowed out inside, the opening lying to the side. Several of these "dreys" are said to be built by each pair, and if the young be discovered they are moved as soon as possible to another nest. The male Squirrel remains with the female most

of the summer, and in the autumn family parties may still be seen together.

To see a party of Squirrels at play is a sight which no one can fail to appreciate; their actions are so full of life and activity, running up one tree, jumping to the next, sliding to the ground, a few yards run and up another tree, evidently in full enjoyment of their own powers and activity. Such a sight is still to be seen in any of our woods, and it is still to be hoped may long remain so, safe from the weapons of the casual loafer, or still more dangerous keeper.

## ORNITHOLOGICAL NOTES FROM SURREY.

BY JOHN A. BUCKNILL, M.A.

SINCE the publication, in the summer of 1900, of 'The Birds of Surrey,' I have, as I felt sure would be the case, had my attention drawn to a considerable quantity of interesting matter which had either escaped my notice or had not been previously communicated to me. Several fresh correspondents have also favoured me with their personal observations. These accumulated notes have assumed such proportions that I have decided to publish them in the form of a connected paper.

The Editor of this Journal has kindly informed me of a small book, published in 1856, entitled 'A New Flora of the Neighbourhood of Reigate, Surrey,' by James Alexander Brewer, F.L.S. This publication, although dealing almost entirely with botanical observations, contains as an appendix an interesting list of local birds compiled by two gentlemen, Messrs. William H. Tugwell and Charles Andrews. As, however, it condescends to no detail of any sort whatever, but is merely a bare catalogue of names, and as it does not include any species new to my already published list, I do not intend to set it out or remark upon it at any great length. It enumerates one hundred and fifteen species, amongst which are to be found the following names:—Merlin, Kite, Buzzard (Common), Hen-Harrier, Short-eared Owl, Great Grey Shrike, Grasshopper Warbler, Wood-Wren, White Wagtail, Grey Wagtail, Wood-Lark, Cirl Bunting, Brambling, Mealy Redpole, Crossbill, Chough, Raven, Hoopoe, Quail, Bittern, Bean Goose, Hooper, Pintail Duck, and Wigeon.

These are the chief names of interest; perhaps the most useful is that of the Kite, which in Surrey has scarcely any record.

The White Wagtail has attached to its name an asterisk, but no indication is given as to the meaning of it. Although the correct Latin name, *M. alba*, is given as well, it is curious to

note that *M. raii* (the Yellow Wagtail) is not included in the list, especially as it has been recorded from the Reigate neighbourhood with some frequency by other observers. This somewhat inclines me to wonder if the species is really intended to be included as such.

The Chough is a curious addition to the list. It has been obtained on only five occasions in the county as far as I am aware, and it is perhaps more than probable that all these specimens were mere "escapes."

The Bean Goose and the Hooper are interesting species from a local point of view. The former has been recorded specifically from Surrey but once, though noticed in general terms by "A Son of the Marshes" in his local works; the latter, together with the Pintail, may have occurred on some such water in the Reigate district as Gatton Lake, from which a good many of the rarer ducks have been occasionally recorded. I do not think that any of the other species enumerated need any particular comment. Taken as a whole, the list may be regarded as interesting and valuable, although it is not now possible to test its accuracy, and it is a matter of much regret that details, at any rate of the rarer species enumerated, were not given.

It is obviously incomplete, and compared with the one hundred and ninety-five species recorded by "Rusticus" in 1849 from the Godalming district, is of quite second-rate importance. Perhaps the most striking omissions are the Ring-Ouzel, Yellow Wagtail, Dartford Warbler, and Long-eared Owl.

Another publication, which was brought to my notice in the pages of this Journal, is a work by Alfred Smee, F.R.S., entitled 'My Garden.' This is a large work—it was published in 1872—and deals very fully with all forms of life in the author's pleasure-grounds at Carshalton.

In an interesting chapter on birds, Mr. Smee records ninety-six visitors to his grounds, some of which are quite valuable. Mr. Smee mentions one occurrence of the Hooper on his lake during severe weather in winter, and in this connection it is worthy of note that this species was recorded from the Wandle near Carshalton in the winter of 1860–1 by Mr. S. Gurney (*vide* Zool. 1861, p. 7386). Mr. Smee also records from his lake the Wild Duck, Teal, Wigeon, and Tufted Duck, besides the female



Smew from Wallington, recorded by Mr. A. H. Smee in the 'Zoologist,' 1871, p. 2487, and the Slavonian Grebe, recorded by the same gentleman in the 'Zoologist,' 1870, p. 2106.

Amongst other of the more interesting species, Mr. Smee notices the Water-Rail, the Jack Snipe, the Common and the Green Sandpiper, the Quail, Hooded Crow, Magpie, Wood-Lark, Grey Wagtail, Grasshopper-Warbler, and the overhead passage of Geese, Whimbrels, and Curlews.

He also says:—"A bird supposed to be a Crane (*Grus cinerea*) appeared in the park every evening for fifteen or sixteen days in Feb. 1871, but it was never absolutely authenticated" (p. 530).

This is a pity, as it would have added another name to the county list. Mr. Smee also speaks of the Rock Dove, though only in a quasi-feral state. On the whole, this publication may be regarded as distinctly useful.

A recent publication, entitled 'Farnham and its Surroundings,' by Gordon Home (London, 1900), contains a chapter upon the Birds and Reptiles of the neighbourhood, compiled by Mr. Bryan Hook; but, although it is a good list of birds which is given, it is unnecessary for me to dwell upon it, as Mr. Hook favoured me with his personal notes in the preparation of my book. I think all the rarer species mentioned by him in this list have been referred to in my text.

I have also, through the kindness of my deeply lamented friend, Mr. Philip Crowley, of Waddon, had the opportunity of making a very close examination of his magnificent collection of eggs, which is very rich in "clutches" of rare Surrey birds, mostly taken in the 'sixties near Farnham, when Mr. Crowley was then at Alton. In those days there must have been a wealth of bird-life on those western moors of quite an astonishing character, as Mr. Crowley's cabinets show.

I have been very carefully through the Epsom College Natural History Club Reports, and have also been favoured with a copy of the Proceedings and Lists of the Wellington College Natural Science Society. Both these journals contain extremely useful information.

The following are the chief notes of importance which I have received since publication.

RING-OUZEL (*T. torquatus*).—One seen, Reigate Hill, in the autumn of 1899 (C. E. Salmon, *in lit.*).

DARTFORD WARBLER (*S. undata*).—Has been noticed near Bagshot prior to 1900 by Mr. F. B. P. Long (*in lit.*). Mr. Crowley told me that his collectors in the Churt district in the 'sixties sent him some sixty or seventy clutches (including two with Cuckoo), all taken in that district. After 1869 a very large forest fire destroyed the tract of furze-covered heath where the bird had been so common. A large number of birds were shot by collectors. Mr. Crowley's collection contained a splendid series of nests and eggs—some forty clutches; the remainder of those he received having been exchanged or given away.

I find also that Mr. J. D. Salmon in his egg collection (now in the possession of the Linnean Society) had a clutch taken in June, 1860, near Frensham, which were sent to him by Mr. James Lewcock (MS. catalogue). It is hardly a matter of wonder that this species has become so rare in Surrey in view of the wholesale destruction with which it appears to have been pursued about this period, but it is evident that it was then extremely abundant in that neighbourhood.

Mr. J. H. Gurney informs me that he considers it extinct on both Walton and Reigate heaths (*in lit.*).

CHOUGH (*P. graculus*).—I am informed by Mr. H. B. P. Long that a bird of this species escaped from captivity at Windlesham about the same time as the specimen which I have recorded as being killed near Effingham in 1894 was shot. As the escaped bird had lost one leg owing to an accident whilst in captivity, and also had a malformed beak, there is no doubt that the Effingham specimen (which presented both these peculiarities) must be now regarded as a mere "escape."

RAVEN (*C. corax*).—Mr. Crowley had observed this bird at Churt, and had an egg from there in 1862. This egg he considered undoubtedly belonging to this species. In the summer of 1896 one was observed at Stoke-d'Abernon by the Rev. T. N. Hart-Smith, of Epsom.

LESSER REDPOLL (*A. rufescens*).—A nest and eggs were taken on May 20th, 1894, near Epsom (Epsom College Reports).

TWITE or MOUNTAIN LINNET (*A. flavirostris*).—Mr. Felton has shown me some eggs taken by himself on June 24th, 1894,

at Weybridge. Although Mr. Felton did not indubitably identify the bird, the eggs are certainly indistinguishable from the Twite's. They will, however, have to be adjudicated upon by the British Ornithologists' Union before any definite statement can be made as to their authenticity.

CROSSBILL (*L. curvirostra*).—A large number near Reigate in the winter 1899–1900 (C. E. Salmon, *in lit.*). Doubtless nests sometimes in the Bagshot district, where it has been seen late in April (F. B. P. Long, *in lit.*); and it also no doubt nests at Witley (H. Eastwood, *in lit.*).

CIRL BUNTING (*E. cirrus*).—Has twice nested in a garden at West Hackhurst, Abinger Hammer (L. M. Forster, *in lit.*).

WOOD-LARK (*A. arborea*).—Mr. Crowley had four clutches from Churt, taken in 1860. I have also a note of three nests near Epsom in quite recent years (Epsom College Reports).

GREAT SPOTTED WOODPECKER (*D. major*).—Mr. Crowley had two clutches from Churt, taken in 1860 and 1863. I have notes of its occurrence at Bagshot, Fetcham, and Mitcham; and of two nests last spring—in the Hurtwood and near Leith Hill respectively.

CUCKOO (*C. canorus*).—To the list of hosts which I gave as having been noticed in Surrey, I am now able to add the Black-cap (Churt, 1860, e coll. Crowley; and Lingfield, 28th June, 1895, part of lot 198 of Stevens's 10,204th sale); Greenfinch (Churt, circa 1860, two clutches, e coll. Crowley); Red-backed Shrike (Churt, June, 1863, *ib.*); Dartford Warbler (Churt, circa 1860, *ib.*); Sedge-Warbler (Carshalton, A. Smee in 'My Garden').

All Mr. Crowley's clutches mentioned above—and most of his Surrey eggs—were taken by one Alfred Smither, of Churt, whom Mr. Crowley employed as a collector, together with two other men named Piercey and Copper. Smither was a well-known character, who also supplied the London professionals with birds, nests, and eggs from the same district.

LONG-EARED OWL (*A. otus*).—Mr. J. D. Salmon had a clutch of three eggs taken on Godalming heath on May 12th, 1840 (MS. catalogue). Mr. Crowley, several clutches from Churt, taken in the 'sixties; and I omitted to state in writing my account of this species that Mr. Howard Saunders, in his 'Manual of British Birds' (1st ed. p. 284, 2nd ed. p. 294), mentions that

he knew of no less than eight broods in a long fir-plantation in Surrey being destroyed by an ignorant landowner. Mr. H. B. P. Long tells me he has often seen it in the Bagshot Woods (*in lit.*).

BITTERN (*B. stellaris*).—Mr. Crowley had a fine male killed on Jan. 17th, 1891, at Beddington corner. This was a great year for this species in Surrey.

SHOVELER (*S. clypeata*).—Mr. R. W. Webb tells me it has been seen on his pond at Milford House. This corroborates Mr. S. A. Davies's account. Mr. Webb also informs me that, as he never allows a gun to be fired on his lake, the Duck and Teal congregate there in large numbers in winter, and occasionally the rarer Ducks pay it a visit (*in lit.*). It is only about eight acres in extent.

TEAL (*Q. crecca*).—I have notes of a nest last year in the county. It is unnecessary to give the locality. Mr. Crowley had many clutches from the Churt district.

WIGEON (*M. penelope*).—Seen, though rarely, on Milford House pond (R. W. Webb, *in lit.*).

POCHARD (*F. ferina*).—The most common of the rarer Ducks on Milford House pond (R. W. Webb, *in lit.*).

TUFTED DUCK (*F. cristata*).—Often occurs on Milford House pond (G. Webb, *in lit.*).

GOLDEN-EYE (*C. glaucion*).—More than once seen on Milford House pond (R. W. Webb, *in lit.*). Mr. Bryan Hook has one from Frensham pond ('Farnham and its Surroundings,' p. 115).

BLACK GROUSE (*T. tetrix*).—It nested prior to and in the 'sixties on the moors round Frensham. Mr. Crowley had three local clutches, all still in his possession up to the time of his death. One of six eggs taken by his collector Piercey in May, 1862, at Churt; a second of six taken by the same man in the same month in the same place in the following year; and a third of nine taken at Hindhead by Smither, of Churt, in May of 1866. These are all splendid clutches, in perfect condition, and, as far as I am aware, are the only Surrey eggs in existence.

I have a note of a pair of birds shot some time ago on Frimley Ridges, which are preserved at Frimley Manor House (Rev. W. Basset, *in lit.*).

Mr. R. W. Webb, of Milford House, Godalming, about the



year 1875, obtained ten eggs from the Duke of Northumberland, and reared them all under a hen. They were all turned out on Witley Common, in order to improve the local stock, and the experiment undoubtedly did some good, but not for very long. The young birds would not answer the call of their foster-mother. The species, in Mr. Webb's opinion, is practically extinct now (1900) in the Witley district (*in lit.*).

**WATER-RAIL** (*R. aquaticus*).—Mr. Crowley had two clutches taken by Smither at Frensham in 1866 and 1867.

**MOOR-HEN** (*G. chloropus*).—Mr. Crowley had a light buff specimen from near Croydon.

**THICK-KNEE** (*Æ. scolopax*).—Observed near Caterham last spring by the Editor of this journal (*in lit.*).

**OYSTERCATCHER** (*H. ostralegus*).—Mr. Bryan Hook has one from Frensham pond ('Farnham and its Surroundings,' p. 116).

**GREY PHALAROPE** (*P. fulicarius*).—Mr. Crowley had one picked up dead at Waddon in 1890.

**WOODCOCK** (*S. rusticola*).—Mr. F. B. P. Long informs me that it breeds regularly in the Bagshot woods; a few nests are found annually, and the young have been seen as early as April 1st. He has an egg taken some years ago in Bagshot Park (*in lit.*). Mr. J. D. Salmon had eggs from Godalming taken there in 1849 (MS. catalogue). Although not generally a good season for cock, fifteen were seen and nine bagged in one day not far from Chipstead in the early part of December, 1900.

**SNIPE** (*G. caelestis*).—Mr. Long tells me that Chobham Common was a great place for Snipe forty or fifty years ago, and a good many are still sometimes shot there (*in lit.*). Mr. Crowley had scores of clutches from near Frensham between 1862 and 1882, mostly in the 'sixties. There was a nest this spring quite close to the Frensham Pond hotel.

**DUNLIN** (*T. alpina*).—Mr. Bryan Hook has a specimen from Frensham pond ('Farnham and its Surroundings,' p. 115).

**CURLEW** (*N. arquata*).—In this Journal (1900, p. 382), a nest of the Curlew is stated to have been taken in the spring of 1896 on Chobham Common with some eggs, two of which were still in existence. As this was the only definite occurrence of the breeding of this species in the county, I have made the very closest enquiry into the record. The result has been very satis-

factory. It turns out that the nest was found in 1897, not in 1896, and contained three eggs. Two of these remained in the possession of the finder, a young man named Tice, until noticed by Mr. S. H. Le Marchant, of Chobham Place, Woking. I was able to obtain the fullest description of the birds from young Mr. Tice, and to examine the two eggs, which were, through Mr. Le Marchant's kindness, lent to me for further consideration. The documents relating to their discovery, together with the two eggs, were submitted to Professor Alfred Newton, of Cambridge, and eventually exhibited by Mr. Howard Saunders and Mr. E. Bidwell at the British Ornithologists' Union, by which body the record has been definitely accepted.

PUFFIN (*F. arctica*).—One caught in the autumn of 1900 near Reigate (C. Reeves, *in lit.*).

GREAT CRESTED GREBE (*P. cristatus*).—Nested or attempted to nest in at least three of their old haunts last year (H. Russell, *in lit.*, P. Crowley; 'Field,' April 21st, 1900).

RED-NECKED GREBE (*P. griseigena*).—The adult male which was picked up on Farthing Down in 1890 ('Birds of Surrey,' p. 346) was in "full breeding plumage," which makes the record much more interesting (J. H. Gurney, *in lit.*).

STORM-PETREL (*P. pelagica*).—Mr. Gordon Colman, of Nork Park, Banstead, has a specimen which killed itself by flying against some glass there five or six years ago.

Since writing the above, I have received a large number of most valuable notes, which I hope to publish shortly in a further paper in the 'Zoologist.'

## NOTES FROM POINT CLOATES, N.W. AUSTRALIA.

BY THOMAS CARTER.

AT Mauds Landing, thirty-five miles south of here, on May 1st, 1900, the extensive salt-marsh, which is usually a dreary lifeless plain, with little growing on it but numerous samphire-bushes about eighteen inches in height, was covered with water, owing to the excessive rainfall this year—a West Australian “lake,” about three miles in length, half a mile wide, and in places three or four feet deep. Great numbers of White-headed Stilts (*Himantopus leucocephalus*) were breeding; the nests, which were mostly on the small patches of higher ground which formed islands, were merely a slight depression lined with a few samphire-twigs or roots. A few nests were built in the tops of the low bushes just above the surface of the water; these nests, naturally, were more compactly built. The eggs, four in a clutch, varied considerably in colour, some of them having the ground colour deep golden yellow, others quite green, but all with numerous and large black blotches. Fresh eggs were to be found there until Sept. 2nd, the birds having an uneasy time, as some natives visited the spot, and kept robbing the nests. On that date many young were fledged, and I also found young in down, which were difficult to detect, as they squatted flat and kept motionless. One of the islands proved a particularly rich field. It was only about fifty yards long and ten wide, but upon it were about twenty Stilts' nests, four of Red-necked Avocets (*Recurvirostra novæ-hollandiæ*), two nests of the rare Gull-billed Tern (*Gelochelidon anglica*), one of the Red-kneed Dotterel (*Erythrogonyx cinctus*), and newly-hatched young of the Red-capped Dotterel (*Ægialitis ruficapilla*). There was one egg in each of the Gull-billed Terns' nests, though they were hardly worthy of the name of nest, the egg being laid in a slight hollow where the surrounding ground was perfectly bare. In shape they were a long oval, pointed at the small end, of a stone-grey colour, with numerous

dark brown blotches and spots, other underlying spots appearing lilac. I shot two specimens of these Terns; there were several pairs there. One bird contained a quantity of grasshoppers, the other small Lizards. The Red-kneed Dotterel's nest was snugly concealed under a tuft of samphire. The eggs (four in number) were richly marked, but just on the point of hatching. The Stilts showed much anxiety about their nests, uttering their plaintive cries, and with fluttering wings feigning lameness to entice one away. The Avocets were very shy, and kept well out of gunshot; their eggs were very similar to the Stilts', but rather larger in size. In the deepest part of the lake was a small island with thick samphire-bushes. Here a pair of Black Swans had built a nest, and had five eggs on May 2nd. On July 27th the young were about as large as a Goose. The family left about the end of September, when the water was rapidly drying.

On May 11th one of the boys, who had been to the boat to wash her down, returned with a Yellow-nosed Albatross (*Thalas-sogeron chlororhynchus*) in beautiful plumage, but the end of one wing had been hurt, and slightly crippled it. It was in very poor condition. On the 18th I found a clutch (two) of the Rust-coloured Bronzewing (*Lophophaps ferruginea*). The eggs were laid on a few sprigs of spinifex between two boulders. On Oct. 25th I also found two fresh eggs of this bird. On May 18th I came across a family of Striated Grass-Wrens (*Amytis striata*) on the rugged range. The young had just left the nest, which was a bulky structure, with foundation of bark off a species of mulga, then made of soft spinifex, with large opening near the top. It was lined with cotton, and built in a bunch of soft spinifex. It was with the greatest difficulty I secured one of the young; they would not fly, but darted from one bunch of spinifex to another with incredible agility. The male bird sat motionless in the middle of a large fig-tree, until detected by the sharp-eyed native, and I shot it, as I did not think at the time it was a Grass Wren perching so quietly in the dense leaves. On May 22nd I found a nest of the Wedge-tailed Eagle (*Uroaëtus audax*) with one egg, on the side of a precipitous gorge in the range. The nest was easy of access from above, and contained a freshly-killed Wild Cat of large size. The same nest contained another egg on May 27th, and yet a third on June 4th. I took them all, as I did not want these birds



rearing young in the middle of a lambing paddock. On June 30th I found another nest, also containing one egg, about three miles further north in the range; probably the same pair of birds. On June 13th, in the great cliffs at the Jardie creek, a White-bellied Sea-Eagle (*Haliaëtus leucogaster*) was sitting on her bulky nest, about one hundred feet above the water, and fifty from the edge of the cliff. On getting above I could plainly see the two dirty-white eggs. The nest was built on a large milk-bush growing on a ledge. In previous years these birds have always laid in a nest on a ledge of cliff on the opposite side of the creek, but quite inaccessible owing to the cliff overhanging. This time I determined to secure the eggs, and returned two days after with ropes and three native boys. Rigging the ropes the same way as the "climbers" on the Yorkshire cliffs, we soon had the eggs. The birds flew round without attempting to interfere, uttering an occasional cry. They afterwards took possession of a newly-built Wedge-tailed Eagle's nest further up the gorge. I took a White-eyed Crow's nest, June 29th, with the unusual number of seven eggs. Brown Hawks had eggs, and Spotted Harriers were building.

Found an Osprey's nest, July 1st, with one egg, on the 2nd one with three eggs, and two other nests containing eggs the next day. The White-headed Sea-Eagle (*Haliastur girrenera*), which is common here in the summer, especially about the Jardie cliffs, disappears in the winter to breed, where I do not know, unless in the mangroves of the Exmouth Gulf. In a large patch of mangroves near the N.W. Cape, July 2nd, Curlews (*Numenius cyanopus*) were in large flocks, which does not give them much time if they are to breed, as they appear again here on the beach regularly about the end of September. I shot one, but there were no signs of breeding. Teal (*Nettion castaneum*) were in numbers in the salt-creeks in the mangroves, and, what is a very uncommon circumstance, were in their full breeding plumage, which is rarely seen. They were breeding there, young in down being numerous, although there is no fresh water within fifteen miles. I shot a Green Bittern (*Butorides javanica*) after some trouble, as it is a very skulking bird, and I have tried before to secure specimens. July 5th, shot a Carter's Desert Bird to see if any indications of breeding. This new species was described by

Mr. North in the Vict. Nat. August, 1900. It is not uncommon in parts of the N.W. Cape peninsula. It appears mostly in the dense low scrub on the flat between the range and the sea, but also occurs in the spinifex in the high range. It flies readily when disturbed, and does not appear to creep so much as the *Amytis* and *Stipiturus*; but its flight is heavy and fluttering, and only for about twenty or fifty yards. They will lie very close after being once flushed. I have no data of their breeding except on Oct. 25th, I shot two which appeared to have been recently breeding. One of them contained a grasshopper fully an inch long, the other a quantity of small black beetles. The only noise I have heard them utter is a harsh "chat chat." Turkeys in down were noted on July 11th, the first eggs on June 4th, and the last on Aug. 28th. July 12th, found a Spotted Harrier's nest with two eggs. These birds were common this good season, and I found numerous nests up to Sept. 13th, when a nest contained two fresh eggs. The nests are built sometimes in a tree forty feet from the ground, or in a bush only four feet high. They frequently contain large Lizards in a paralysed state, placed for the benefit of the sitting bird; one nest contained four eggs.

Kites (*Milvus affinis*) were very common in 1900, but rarely visited the coast. Inland, when driving through the high grass, they were at times a nuisance, as several of them would accompany the buggy in order to feed upon the numerous grasshoppers which were disturbed in the vegetation. The birds would flit close past the horses' heads, making them startled and nervous. They appeared to catch the grasshoppers with their feet, and fed on the wing. About the middle of July numbers of their nests were to be found in the white gums. The birds appear to prefer to build towards the end of horizontal limbs. Little Eagles (*Nisaetus morphnoides*) generally build in the fork of a large straight-stemmed tree. I found a nest containing one egg on July 18th, another on the 21st with two, and one with newly-hatched young, and a fourth nest the next day with two eggs much incubated. The birds are very shy, and seem to be fond of feeding on the Teal. Black-shouldered Kites (*Elanus axillaris*) were fairly plentiful this winter, but very shy. They have not occurred here since the great drought of 1890-91. I failed to find any nests, but saw birds here early in October. About

thirty miles inland from here are numerous belts and patches of a sort of mallee timber. Several times, passing through, I have heard beautiful rich flute-like notes from a bird that kept out of sight. Being in the locality on July 20th, I determined to try again to identify it, and camped in the timber. Some hours before daybreak, by the light of the moon, the bird began its rich notes, and continued until after daylight. The native and self followed the notes a long time without seeing the bird, the song always keeping ahead as we walked. We were returning to camp somewhat disgusted, when I saw two black and white birds fiercely attacking a Crow. On going that way we noticed a bulky nest in a tree about twenty-five feet from the ground. Feeling sure this was the nest of the strangers, we sat down to wait; but the Crows made most persistent and daring attempts to steal the eggs above us. Before long one of the birds returned to drive off the Crows, and I shot it. It proved to be a Black-throated Butcher-Bird (*Cracticus nigrigularis*). The male was of a dingy grey colour, not black as was the female. The nest contained four eggs. Very curiously, as we were walking away well pleased with our success, we saw a similar nest, but not so large, about fifteen yards from the other. Again we hid, and awaited results. The birds soon came to the vicinity of the nest, and on shooting one, to my surprise, it was the handsome Yellow-throated Minah (*Manorhina flavigula*), a bird quite unknown here before. The nest was built among slender twigs at the top of the tree. However, I sent to the buggy for a tomahawk, and, cutting down another tree, trimmed its branches so as to make a rough ladder, by which I secured the two handsome salmon-coloured eggs. The nest was somewhat large, foundation of twigs, lined with spinifex and grass; the depression for eggs was shallow, that of the Butcher-Birds deep and cup-shaped.

The same trip I noted nests of *Ptilotis leilavalensis*, with eggs, young, and uncompleted; also several nests of Black-tailed Native Hen, Kestrel, and Fairy Martin. There was a small colony of the latter nests under a slightly hanging shaly cliff. Examining the nests, two were found to contain Snakes. As it was an awkward place to kill them, and I did not want to destroy the surrounding nests, I went below and fired a shot into each nest containing a Snake. A Carpet Snake, about four feet long,

came tumbling out of each; they had been tightly coiled up inside, and, when suddenly disturbed by the smashing of the nest, rolled down the sloping foot of the cliff still coiled. Each Snake contained two or three unfortunate Martins. I may mention that one very hot day last summer I went to have my dinner in a large cave in the range. Water drips from the roof, and we have a hole hollowed out below large enough to dip a pannikin in to catch the drip. Seeing no water, I foolishly thrust my hand in the hole, and felt a large Snake. After a great deal of poking it was induced to come out, and was killed. It was nearly five feet in length, and, on being cut open, was found to contain four Chestnut-eared Finches, fallen victims to their insatiable thirst. These little birds frequently build their flimsy grass-nests in the bottom part of larger nests, especially Hawks' and Eagles'.

Shot four Freckled Ducks (*Stictonetta nœvosa*) on July 21st, a species which, as far as I know, has not been recorded from this district. They were fat and remarkably good eating. Plumed Whistling Ducks were in great numbers this year, and I secured specimens of Shoveler (*Spatula rhynchotis*) and Pied Goose (*Anseranas semipalmata*).

On Oct. 24th I found an egg of the Long-billed Stone Plover (*Esacus magnirostris*) laid on the summit of a high shingly ridge on the beach towards the N.W. Cape. There was no nest whatever. I took the egg (which resembled that of a Caspian Tern in colour and size, but was blunter at the small end), and, watching the bird half an hour later through my binoculars, saw it cautiously return to where it had laid, and seat itself in the empty nesting-site. In a few seconds, however, it seemed to realize its loss, and, rising, ran down the ridge to its mate. A pair or two of these birds are always at that particular spot, where the reef comes in to the beach, which is formed of coarse shingle and shell, with broken surf. I have seen odd birds south of there, but never so far as here. Noted a Tawny Frogmouth (*Podargus strigoides*), Oct. 30th, sitting on two fresh eggs in a mallee tree, about ten feet from the ground. The nest was absurdly small and slight. The bird sat motionless in an upright position, in which it looked just like a short broken dead limb, although the buggy passed immediately beneath it. On Dec. 4th the natives brought in a fledgling bird.



At the end of September, when visiting my inland run, there were great flocks of Straw-necked Ibis (*Geronticus spinicollis*) about the pools and adjoining flats. When there again on Nov. 3rd, my man in charge of stock told me that about the middle of October he had sent two boys with the bullock-cart eight miles down the creek to bring back a large iron tank swept away by the floods. They returned with quantities of Ibis's eggs, and said they had eaten a great many, and more were left; "can't finish 'um." As a colony of these birds is a rare sight—in fact, I do not know if there is any record of their breeding in West Australia—I drove down, but found most of the young birds had fledged, and only a few addled eggs were left in the nests. Of these I secured about a score. The nests were in hundreds, mostly built on low bushes flattened down by the flood, about three feet from the ground. Some of the bushes contained a cluster of six or eight nests, all interbuilt; they were of flat form, lined with white gum-leaves. A few nests were built on the ground. The colony must have been a most interesting sight when all the birds were there. A few full-grown young were about which could not fly. The native with me caught several, and of course started killing them all. However, I was in time to save one, and brought it back to the camp, where in a few hours it seemed quite content; but, as it was liable to stray too far away in pursuit of its favourite grasshoppers, we tethered one leg by a string, and fed it out of a damper-dish in which pieces of bread and meat were dropped. The bird would stand inside, and feel about for the lumps, holding its beak mostly in a horizontal position, at times almost reversing its head. After a meal it would attack, with a sharp scream, some of the fowls or young Cockatoos as far as its tether would permit; its long reach of bill giving it all the advantage. It is now at the house, with full liberty. It feeds readily from the hand, and will attack the Dogs and Cats if they venture too close. Two specimens of the rare Painted Finch (*Emblema picta*) were obtained here, and others seen; they had doubtless bred in the neighbourhood.

To our surprise, this year the large pools at my inland run on the Cardabia Creek contained numbers of small fish from four to six inches in length, and I hear they also occur in the Lyndon

River, but were certainly never there before. I think their presence can be accounted for by the action of a squatter on the Upper Minilya River, Mr. M. C. R. Bunbury, who wrote a letter to the 'Western Mail' of April 22nd, stating that in the winter of 1899 he brought a number of small fish from the Lyons River (which runs into the Gascoyne), and turned them into the Minilya, where they soon spread. The Lyndon River runs west parallel to the Minilya about twenty miles more or less to the north. Both rivers (when they do run) empty into the vast salt-marshes near the coast, but, so far as is known, do not reach the sea. The Cardabia Creek is a tributary of the Lyndon, and during the floods the fish must have come down the Minilya from Mr. Bunbury's house to the marsh, about ninety miles, then swam up to the Lyndon, about thirty miles, and thence up it and its branches. Unless they have the power of living under the dry mud, like the fresh-water Turtles and Frogs, they must all die when the pools dry up, as they are not permanent; but perhaps the spawn will serve to propagate the species.

## NOTES AND QUERIES.

### MAMMALIA.

**Experiments in Hybridity at Pretoria.**—I have at present five Zebras (Chapman's), three of which have been interviewed by a Donkey stallion; I am very anxiously awaiting results, which I will not fail to let you know in time. I have been very successful in breeding crosses between *Mus chrysophilus* and *M. decumanus*, and have about twenty-four at present. The result of a cross between the ordinary albino *Mus musculus* with the Striped Mouse (*Arvicanthis pumilio*) is a peculiarly cream-coloured, not striped specimen, which looks very much like a cream-albino Mouse with black eyes, which stand out very distinct against the cream-coloured fur. I have also bred *Galago moholi* (*Otolicnus galago*) and *Eliomys nanus* with great ease, and am now trying to cross *Canis mesomelas* with a Collie-Dog, but have not seen any pairing yet, notwithstanding many attempts.—J. W. B. GUNNING (Director, Zoological Gardens, Pretoria, Transvaal Colony).

[The first experiment detailed above is very opportune, Mr. S. A. Deacon, of Cape Colony, having recently written in the 'Field' that he considers the Quagga to have been originally a cross between Donkey and true or Mountain Zebra.—ED.]

### AVES.

**The Winter Singing of the Song-Thrush (*Turdus musicus*).**—I am glad that Mr. Warde Fowler has attacked this subject (*ante*, p. 212), and I hope that gentleman will work out the question involved to a final conclusion. But I must express surprise at the distinction drawn between the autumn and winter songs of the species. The Thrush is not alone in this matter—the Starling and the Robin are its companions; and I feel convinced, from close daily observation for years at Stroud and Cheltenham in Gloucestershire, and at Eltham in Kent, that in the case of each of the above species there is no definite change of voice from autumn to winter song, but only that gradual progressive development from feeble to strong notes, and from simple to complex strains, which occurs in all song-birds (quickly or slowly) when the season of song approaches. I should be glad if Mr. Warde Fowler would ascertain from several districts whether the Song-Thrush was in voice in October.

What of October singing? Is it autumn or winter song? In September I have heard only an occasional loud note from the Thrush, but

some twittering. In October many Song-Thrushes begin to sing: *and they don't stop*, weather permitting, all the winter, but gradually attain all that excellence of variety and mimicry which makes their music as instructive as beautiful.

I beg humbly to protest, though my voice may sound as wheezy as those of Mr. Warde Fowler's female Thrushes (and I never heard such in song), against the separation of the autumn and winter singing of this species. So far as a number singing at once is concerned, emulation may have much to do with it, as it seemingly has with the sweet "chiming" of Willow-Wrens, and the musical rivalry of Robins.

For how much longer (and why) shall we continue to deny to the Thrush and other such songsters an artistic sense and love of their art—a sense which induces a marvellous variety when a dull repetition would seem as effective, and a love which leads to study hour by hour and day by day?—CHARLES A. WITCHELL (St. George's Place, Cheltenham).

The Occurrence of the Red-throated Pipit (*Anthus cervinus*) in Ireland.—When I was on the west coast of Ireland, on May 26th, 1895, I found, on a lonely mountain side in Co. Mayo, a Pipit which at the very first glance I was satisfied was quite new to me, being distinct in appearance to any Pipit I had ever seen before. The bird perched on a spray of a whin-bush, and looked full face at me, not more than fifteen yards away. The general outline of the bird, its buffish chestnut throat, extending also to sides of head and breast, and bold black-looking stripes on neck and breast, were so striking, that I was at once convinced that there was something new in front of me, and secured the bird. At that time I had never seen an identified skin of *Anthus cervinus*, and the only plate that of Bree ('Birds of Europe,' vol. ii. p. 155), which misled me somewhat, as he figures an adult male bird without much striping on neck and breast; and, being busy at the time of my return, the result was that my bird was placed away in a cabinet for future identification and overlooked, until I secured the autumn-plumaged specimen which was shot at St. Leonards, and identified by Dr. Bowdler Sharpe (*ante*, 1896, p. 101). An examination of this bird, and the investigation I then made, at once suggested to me what my own specimen was. I sent my bird at that time for identification to a gentleman who then did not fully confirm my views, stating only that it was a "queer specimen," which disconcerted me, as I was convinced from descriptions I had read that my bird must be *A. cervinus*; later, however, he has agreed with me, after another examination of the bird. My specimen is a male, and, according to Seebohm's excellent descriptions ('British Birds,' vol. ii. pp. 228–232), is in the second year's plumage, which is much worn and abraded, the tail especially showing signs of wear and tear, and would undoubtedly have been moulted that season.



From this and its movements—it remained steadfastly on the same bush, following all my movements, and seemed loth to leave the spot, just as a breeding bird would have done—I suspected at the time that the bird was breeding, and regretted much that I did not watch it to its nest before killing it. A long search afterwards for a nest was fruitless, and as I did not see another bird like it while I was on the mountain side—I was there for several days—I may have been mistaken in this surmise, as the date—May 26th—would not be too late for it to be resting only on its way to its northern breeding haunts.

It will perhaps be as well to give here a description of this bird :—The general appearance is very dark, and bold in its markings, as compared with *A. pratensis*. The throat, upper breast, commencement of flanks, and lower part of cheeks was, in the living bird, a light buffish chestnut, deepest on throat; but this has now faded to buff. Lores and round the eyes buffish white, which contrasts sharply with the dark crown. On the under parts, which are creamy white, there is a series of bold, broad, black stripes extending from throat to end of flanks, which are of an obscure buff. Belly and under tail-coverts cream-white. Top of the head and mantle have bold blackish brown centres to the feathers, broadly bordered on mantle, and faintly on crown, with cream; but the borders to most of the feathers have been worn away, giving the back a very dark appearance. Back of the neck from nape much paler, being a buffish brown. Wing-coverts, greater and median, dark brown, broadly margined with cream, which would form two bars across the wing; but this, like the tail, is much worn and abraded. Outer tail-feathers have the outside portion white from the base, inside dark brown, as are all the others excepting two central ones, which are lighter brown; the tips only of second pair appear to have been white, but, as I have before said, this member is so worn and short, that not much can be judged of it. Legs and toes dark brown. Bill, upper mandible dark brown, lower pale brown. Axillaries yellowish white on outer portion, inner fringe greyish.

On Aug. 9th, 1898, Mr. H. Elliott Howard shot a Pipit in Co. Donegal, which he most kindly presented to me, while still in the flesh, on the following day, as it was on the morning of his return to England when he procured the bird. This bird at once arrested Mr. Howard's attention, from the conspicuous dark lines with nearly white margins on the mantle, which were distinctly observable both when the bird was on the ground and during flight. This specimen is remarkably distinct in its markings, and much easier to identify than the St. Leonard's bird; indeed, it could not be mistaken for a Meadow-Pipit, and directly Mr. Howard handed the bird to me I said that it was either a Red-throated Pipit, or the St. Leonard's bird was not correctly identified; but there need not be a shadow of doubt

on this point. From Seebohm's description I should say that the bird is an adult male in winter dress, and was in full moult at the time it was procured. Mr. Howard saw others, and under circumstances which led him to suppose that they had been bred in the district. On this score also Mr. Howard's surmise may be wrong, and the birds he saw may very likely have been a small flock, or family party even, resting on their return migration, as the date in this case also favours this view. Nevertheless, it is quite possible that the bird may occasionally breed on the north-west or west coast of Ireland—Mr. Howard has not met with the bird since, although he has several times returned to the coast; neither did I see it the last time I visited Donegal, and paid special attention to Pipits—and has been overlooked by Irish naturalists, from the fact that the spot where the bird was found is very secluded, and the ground is strictly preserved, no person being allowed to carry a gun in the district without the permission of the lord of the manor. In this communication I have purposely clouded localities—the counties only are sufficient; but I am pleased to say that should any of the birds return at any time there is not much danger of their retreat being invaded by collectors.

During my journey across Ireland from west to east, I paid special attention to Meadow-Pipits, after procuring my specimen, and did not see any more like it; they were all of the type with which I am so thoroughly familiar, but perhaps slightly darker on the upper parts when nearest the east coast. On the west coast they struck me as being distinctly greyer on the mantle and upper parts generally than in the typical birds. The general appearance of Mr. Howard's bird is very bold and striking. The throat is pale buff, breast and flanks a rich brownish buff, graduating into cream on the middle portion of breast and belly, under tail-coverts rich cream; from the throat to end of flanks a series of bold black stripes, but not so broad as in the summer specimen. Crown dark brown, centre margined with fawn-brown, cheeks and neck an obscure greyish brown, tinged with buff on ear-coverts. Mantle broad, black, centres with very distinct buffish white margins on the scapular region; middle of back and rump a more obscure black, margined with fawn-brown; upper tail-coverts fawn-brown, with more dusky centres. Tail—two centre feathers missing—blackish brown, fringed with light fawn, excepting two outer feathers, which have the outer portion dusky white to the base; second pair tipped only with dusky white. Wing—closed—dark hair-brown, margined with buff, the median and greater coverts broadly margined with a lighter buff; axillaries palest straw-yellow on outer portion, obscure grey on inner. Bill dusky along culmen and tip, other parts pale brown. Legs and toes whitish buff, nails dark umber. The general appearance of the bird fully bears out its specific name *cervinus*—fawn-coloured.

It will perhaps be remembered by some how much controversy was, in 1896, centred round the assertion I made (*ante*, 1896, pp. 101, 193, 256, 300, 302, 353) in connection with the St. Leonard's bird, *viz.* that the markings were so distinct that I could distinguish the bird amongst a flock of Meadow-Pipits with or without the aid of field-glasses. After my experience with the Pipits here recorded, and increased observations here, and with other Pipits in Iceland and elsewhere, I repeat my assertion with redoubled emphasis. Any ornithologist who thoroughly educates his eyes to the outlines and general appearance of our native birds in the field ought to be able to distinguish between *A. pratensis* and *A. cervinus* in autumn or winter plumage—giving, of course, a moderate range—without difficulty. The Pipits are certainly a puzzling class of birds, and resemble each other closely in plumage; but there is, in addition to their distinct songs, a difference in *build* between them, which is most noticeable; for instance, the difference in build between *A. trivialis* and *A. pratensis*, when either may be feeding in small flocks in a meadow in early spring, ought to be clear to any acute observer without having to trust to the notes of the birds. This difference in build is also very striking in other Pipits I have seen abroad. I know that it must be most difficult for those who have to deal chiefly with skins in a cabinet to appreciate this difference; to do so there must be a thorough acquaintance with the birds in the field.

In conclusion, these two Irish examples of *Anthus cervinus* have remained in my cabinet unrecorded for unavoidable reasons, and waiting until I had an opportunity to send them to an authority to confirm my identification. Recently Mr. O. V. Aplin paid me a visit, and had no hesitation in pronouncing them specimens of this bird; and, as Mr. Aplin has shot dozens of them abroad, and is well acquainted with their general appearance and changes of plumage, his identification, added to the unmistakable descriptions of Middendorff, Bree, and Seebohm, may, I think, be taken as settling the point.—F. COBURN (7, Holloway Head, Birmingham).

Rosefinch released in Devon.—Having to proceed to England on leave, I took the opportunity of bringing with me some specimens of the Rosefinch (*Carpodacus erythrinus*), in order to release them in England. Two or three died on the voyage, and one escaped, out of the dozen I originally started with; but I was able to release the remaining birds from the train soon after it left Plymouth on June 16th, and had the satisfaction of seeing them go off strong on the wing, although they were not in very good condition of plumage, and could mostly be easily recognized as captive birds if shot by anyone at present. I did not like, however, to keep them longer, as in the cage—a fairly large one—they did nothing but eat and fight, and were getting grossly fat. I am sorry to say that all are males, females being almost unprocurable in Calcutta this year. But as the female Rose-

finch has occurred in England, I hope they may find mates if they remain in the country. At all events, those who make a practice of destroying rare birds will hereby be warned to be suspicious of the Rosefinch in Devon at present, for such of these specimens as get successfully through the moult will, of course, be undistinguishable from wild arrivals. One bird's leg has been broken above the hock, and has healed again; so this individual may be recognized if procured.—FRANK FINN (c/o Zoological Society, 8, Hanover Square, London).

**A Stronghold of the Chough.**—There is as much, if not more, satisfaction in recording the prosperity of a rare resident British bird as in announcing the capture of the most extraordinary stragglers to our shores. *Pyrrhocorax graculus* is a species whose distribution, on the sea-cliffs of our islands, has been steadily narrowed; and, as it is a very sedentary bird, there is no probability that once exterminated it will ever re-establish itself. I have within the last few years paid three visits to a spot on the western coast of Scotland, where the Choughs, if not abundant, are at least firmly established and prosperous. They suffered very severely during the hard weather at the beginning of 1895, but since then I am assured they have increased. They nest in three spots on this island—all very inaccessible cliffs on the seashore—and very likely these three colonies keep more or less distinct. I was anxious to ascertain how many pairs there were, which is obviously difficult to determine; and the gamekeeper assured me that there were "several hundred pairs," and that there was not the slightest danger of their becoming extinct. According to my observation, the birds hardly ever leave the sea-coast. I have seen small parties flying perhaps half a mile inland: their calls as they pass over immediately attract the attention of an ornithologist, and much resemble those of a small party of Jackdaws, but are rather shriller. I have also watched them on the rocks at low tide, apparently searching for food. The position of their nesting-places makes it practically impossible to rob them, and I do not think the birds are persecuted by anyone. The gamekeeper took some young ones, but failed to rear them; they make very engaging pets, I believe. A nest with eggs was also recently taken by the keeper for an American museum. The birds may be identified at a great distance with a glass, both when flying and perching, by their long red bill. As far as I can discover, the west coast of Scotland is now the chief stronghold of the Chough, though it has become extinct in some of the islands within comparatively recent years. There are still some in Ireland, in Wales, in Devon, and in Cornwall. Mr. Harting, in his admirable 'Handbook of British Birds' (p. 93, new and revised edition), mentions Dorsetshire. Without making public the exact locality (as I have purposely refrained from doing), I should be interested if some Dorsetshire correspondent would



define the position of *P. graculus* in the fauna of Dorset at the present day. HAROLD RUSSELL (16, Beaufort Gardens, S.W.).

**Hoopoe at Reigate.**—On the evening of June 22nd I happened to be wandering in Reigate Park, in Surrey. Entering the park by the gate opening into Bell Street, I had taken the path through the woods to the right near the meadows, and had not gone more than a couple of hundred yards when a bird flew across into the park from the low fields to the right. It settled on the ground about thirty yards off, and I had a good look at it before it flew on. It was a Hoopoe (*Upupa epops*). The occurrence at Reigate of so rare a visitor should, I think, be recorded.—C. T. BINGHAM (31, Earl's Court Square, South Kensington).

[This is a most interesting observation. The bird was recorded from the same spot in the 'New Flora of Reigate,' 1856 (*cf. ante*, p. 247).—ED.]

**Spoonbills at Great Yarmouth.**—Scarcely a day has passed since early April to this day of writing (June 21st) but on what one or more Spoonbills (*Platalea leucorodia*) have been in sight on Breydon. First one was seen on April 10th, twelve on April 27th, and five more next day—seventeen in all! Seven observed on May 7th; I saw two on May 16th quite near my houseboat, and I sailed up to a couple on May 17th. Two asleep near my houseboat on June 2nd, in company with Saddleback Gull, on most amicable terms. Saw four again on June 7th, which were very tame, and with some two hundred Gulls on a flat quite near the bridge now being built across Breydon. On June 15th observed five being followed and disturbed by a Heron, and on June 21st four were still about.—A. PATTERSON (Ibis House, Great Yarmouth).

**Wigeon breeding in Ireland.**—Believing that the Wigeon (*Mareca penelope*) bred within a few hours' riding of my home, I decided, on May 1st, accompanied by my friend Mr. S. Savage, to make a raid on its breeding-place. We started at five o'clock in the morning on a lovely day. After a long ride and a longer tramp, we at last came on the object of our search—a nest with eleven eggs. The nest was in a dry meadow among rushes, about two hundred yards from a small lake. I also found another nest with three eggs, this time in a wet swamp. Later on Mr. Savage found another nest with nine eggs in a clump of rushes in a very dry meadow. We went home that night with very light hearts, having had, I believe, a very good day's experience. To make sure, I sent some of both down and eggs to Mr. Ussher, and also to Mr. Patterson, which they kindly identified as genuine Wigeon without any doubt. I think this is the first record of the Wigeon breeding in Ireland.—JOHN COTTNEY (Hillsborough, Co. Down, Ireland).

**Pairing Manœuvres of Pigeons, &c.**—With reference to Mr. E. Selous's remarks on the covering of the male domestic Pigeon by the hen after normal pairing, I may mention that I have frequently seen this action myself, and believe it to be not unusual. The behaviour of birds *after* pairing has not yet received sufficient attention from observers. I have myself noticed that the male Zebra Finch (*Taniopygia castanotis*), after pairing, vibrates his tail so quickly that it is almost invisible; and that both sexes of the Larger Tree-Duck of India (*Dendrocynna fulva*), as soon as the action is performed, "tread water," with one wing raised, in a very curious fashion. These manœuvres are, I think, simply due to general excitement; but such performances are worth recording, as often, if occurring *before* pairing, they would be set down as gestures designed for sexual attraction.—FRANK FINN (c/o Zoological Society, 3, Hanover Square, London. W.).

**Little Bustard in Derbyshire.**—On May 14th a Little Bustard (*Otis tetra*x) was shot by a farmer on Middleton Top, near Youghreave, North Derbyshire. He saw that his victim was something uncommon, and took it to a local stuffer. The sex was not determined by dissection, but no doubt the bird is a female, as the plumage is devoid of all ornaments. This is only the second recorded appearance of the Little Bustard in Derbyshire, the first being in 1797. This specimen is now in my collection.—W. STORRS FOX (S. Anselm's, Bakewell).

**Birds in Lisbon.**—Our ship came into the Tagus on April 17th, and the following notes refer to the birds observed in Lisbon or the neighbourhood during the five days I spent there. After some Gannets at the mouth of the river, the first remarkable bird was a Kite, who, in company with Sea-Gulls, flew up and down the river opposite the town. I saw it again on a subsequent occasion flying backwards and forwards in easy graceful circles, often within a few yards of the quays, now and again swooping down upon some scrap of offal which the current brought past. From its forked tail and mottled rufous plumage, I was able clearly to identify it as *Milvus iclinus*, the same species who used to perform the office of scavenger in London in the Middle Ages. The Gulls were for the most part in immature plumage. The vast majority of the adult birds were Lesser Black-backed Gulls. Next in numbers came Herring-Gulls, which, I think, were all of the yellow-legged species—the *Larus cachinnans* of Pallas. In Vigo Bay, on the Spanish coast north of Lisbon, I was able clearly to see the brilliant yellow legs and rather darker mantles of these birds. Whilst on the journey home, at Cherbourg, I could see with equal certainty the flesh-coloured legs of the ordinary British Herring-Gull. A few birds seemed to be Common Gulls, and a great number, with hoods in various stages of completeness, belonged to the black-headed family, which, from the deep

blackness of their heads, I put down as Mediterranean Black-headed Gulls. Lisbon differs strangely from the towns of Southern France and Northern Italy in being full of bird-life. From every garden came the notes of the Blackcap, already nesting, and on the whole the commonest songster. I had rather expected to meet with the Orphean Warbler, but it may be that (as none of this species pass the winter in Europe) it had not arrived, or that it is confined to the country and the olive-gardens. Goldfinches were abundant. The call-note of the Greenfinch was to be heard on every side. The Great Tit was vociferous, and I saw Blue Tits busily engaged in destroying the blossom on the trees. In the cypress-grove at the English Cemetery there were many Blackbirds, who seemed to find there a retreat from the heat, and an abundance of snails among the grave-stones. Thrushes, on the other hand, were remarkable by their absence. I saw a few Redbreasts, and heard one singing (a strange and powerful song it seemed to me) at Cintra. In the Botanic Gardens and elsewhere a Warbler of an unknown species was diligently searching the trees for insects, and singing a pleasant song; its habits and movements were those of a large Willow-Wren, and I identified it to my satisfaction as the Melodious Warbler. My only doubt is that so reliable an authority as Colonel Irby declares that it does not arrive in the south of the peninsula till April 25th. The sky everywhere was alive with Swifts, whirling and screeching overhead. Swallows and House-Martins were also plentiful, though neither had reached England when I left. I saw Swallows descend in the busiest street to gather mud from between the tramway-lines. The Chaffinch was a common cage-bird, but I saw none out of captivity. The absence of Chiffchaff and Willow-Wren was surprising, but still more the absence of Jackdaws: for, though most steeples fell in the great earthquake of 1755, there are still plenty of desirable nesting-sites. In the market I saw cages with Turtle-Doves, but, from their demeanour, they had been some while in captivity. From the train, a few miles out of the town, I saw a Stonechat. The woods of Cintra resounded with the call of a Woodpecker, very similar to that of our "Yaffler." I judged it to be that of *Gecinus sharpii*. The only Wagtail I saw was near a pond at Cintra, and belonged to the beautiful blue-headed species (*M. flava*), varieties of which have received many different names. In the lodge of Gardens of Monserrate there was a much decayed specimen of a small raptorial bird which may once have been a Hobby. I looked in vain for the Iberian Sparrow, but the House-Sparrows were abundant. It is one of the ornithological sights of Lisbon to see them go to roost in the trees of the Avenida. They weigh down the acacias in their thousands, and their twittering is like the crash of a waterfall. It is said that people with nerves have to avoid apartments which look upon that street. The only signs of migration on the

voyage out and back were many pairs of Puffins, which seemed to be making their way in couples to their nesting haunts, and a Tree-Pipit, which came on board in the middle of the bay half-way between Finisterre and Ushant on April 23rd. The sea was calm; the wind light, and from the north-east. The bird flew some way alongside of the ship before alighting in a ruffled, but not exhausted, state. In the English Channel small parties of Swallows were flying across, near above the water, and with great speed.—HAROLD RUSSELL (16, Beaufort Gardens, S.W.).

**With the Birds in May, 1901.**—I can but very seldom take a holiday in May, but this year I was enabled to be absent from home for the month, and spent most of my spare time in observing the birds in and near the places I visited.

*London and its Vicinity.*—Here I visited some of the localities mentioned by Mr. Swan in his 'Birds of London' as likely to be fruitful, and found that Hadley Woods and Richmond Park were admirable hunting-grounds for the ornithologist.

Hadley Woods, between New Barnet and High Barnet, are  $11\frac{1}{2}$  miles from King's Cross, and in this delightful resort I found the Nightingale, Blackcap, Garden-Warbler, Willow-Warbler, Chiffchaff, Greater and Lesser Whitethroats, Whinchat, Spotted Flycatcher, Green Woodpecker, Long-tailed Tit, and many other birds less worthy of notice. Nightingales, Blackcaps, and Lesser Whitethroats were exceptionally numerous. I should think that nearly all our summer birds could be found in these delightful woods.

Wanstead Park and lakes will well repay a visit, and there too I heard the "three feathered kings of song"—the Nightingale, Blackcap, and Garden-Warblers; but the avifauna was not so rich as that of Hadley Woods.

At Richmond Park, I noted, in about three hours, thirty-four species, including Nightingale, Blackcap, Garden-Warbler, Wood-Warbler, Redstart, and Ray's Wagtail. This highly favoured locality will always repay a visit from the bird-lover, and, indeed, from any lover of nature. Windsor Castle was again plainly visible in the far distance.

My next visit was to that most delightful of all health resorts, Bournemouth, and there I found the lovely Talbot Woods full of bird-life. I have never heard the song, or rather songs, of the Wood-Warbler to such perfection as there. The Tree-Pipit also was much in evidence, and, what was very strange, I heard there a Chaffinch, which, after its three pre-fatory notes "fritz fritz fritz," sang the Willow-Warbler's song, and not its own.

At Christchurch, five miles from Bournemouth, I found many birds in a pleasant row down the River Stour towards Hengistbury Head. My list



of thirty-seven species in about three or four hours included the Reed- and Sedge-Warblers, the Lesser Tern (also observed at Weymouth, May 13th), and other interesting birds.

The New Forest: In a walk through Lyndhurst to Emery Down and Brockenhurst, I only added the Stock-Dove and Nuthatch to my former lists; but I found the Wood-Warbler especially numerous there also.

At the close of our visit to delightful Bournemouth, we journeyed to Weston-super-Mare, which I found also an excellent station, especially in the Bleadon and Uphill direction. There I saw and heard more than one Gull-Bunting, and at Brean Down had a fine view of a small flock of Sheldrakes disporting themselves in the sea. The Raven still breeds on this lofty promontory, and Mr. Pople, our boatman, assured us that about two hours before our arrival two old birds, accompanied by five young ones, had for some time hovered over their heads; unluckily they did not favour us with an appearance.

I have kept to the close of this rambling communication the following incident:—On Sunday, May 12th, when walking up the Vale Road, Bournemouth, I heard a bird in the shrubbery of Carlton House, whose note I believed I recognized at once as that of the bird I had heard only at Karlsbad and at Brunnen in 1893, and I said to my wife, "That's Bonelli"; alluding to Bonelli's Warbler, which was identified for me by Rev. W. Warde Fowler on the Axenstein some years ago. On the 14th I heard and saw the bird again, and called at Carlton House, where the proprietor, Mr. Hamlet Kinsey, received me most kindly, and said that he had been watching that bird for some days, that he had never heard one like it before, and wondered what it could be, as his attention had been at once arrested by its unfamiliar note. I wrote at once to Mr. Warde Fowler, and had a reply from him, in which he said: "Your description of the bird, as you saw it, is Bonelli all over; your account of the song is utterly puzzling. The only conclusion I can come to is that it is either Bonelli's or Benson's Warbler, and which I can't say." Nor can I, nor do I lay any claim to be the discoverer of this Warbler in England. My object is rather to direct the attention of other ornithologists to the matter, who may have longer opportunities of observing the migrants on the south coast of England than I had, or can have.—CHARLES W. BENSON (Karlsruhe, Montpelier Hill, Dublin).

#### REPTILIA.

**Black Adder in South Wales.**—On Thursday, June 13th, I received, from the Rev. D. H. Davies, Cenarth, South Wales, a serpent for identification. It is a Black Adder, a variety of our poisonous reptile extremely rare in this country, there being only two British specimens at South

Kensington. This specimen is  $20\frac{1}{2}$  in. long, a female. I hope to say more about this later on. A fatal case of Adder-bite in a boy  $4\frac{1}{2}$  years old is reported to me from Cumberland by Dr. Eden Cass (June 18th, 1901).—  
GERALD LEIGHTON (Grosmont, near Hereford).

#### PISCES.

Spotted Ray at Great Yarmouth.—On March 18th I saw, in this town, a Spotted Ray (*Raia maculata*), which may be described as of the size of a dinner-plate. It possessed a complete and well-formed fin, the size of a business envelope, erect upon the centre of its back. It could easily be raised or depressed to one side, and may not have been greatly inconvenient to the fish when living.—A. PATTERSON (Ibis House, Great Yarmouth).

#### BIBLIOGRAPHY.

I am preparing a list of the Birds of Berkshire, and shall be very much obliged to any correspondents who will be good enough to forward particulars of rare or interesting wanderers that may have come under their notice.—H. NOBLE (Temple Combe, Henley-on-Thames).

## NOTICES OF NEW BOOKS.

*Animal Life: a First Book of Zoology.* By D. S. JORDAN, Ph.D., &c., and V. L. KELLOGG, M.S., &c. Henry Kimpton.

SINCE the publication of Semper's 'Animal Life,' we know of no book that has so surveyed the field of animal bionomics as this volume. The standpoint of the authors, however, is very different. Semper was outside the cult of Neo-Darwinism; Jordan and Kellogg will probably satisfy the canons of that apparently now dominant school of thought. When the perplexed evolutionist, wearied and unsettled with the new theories of advanced disciples, now and again goes back to the teaching of the master, and reperuses that wonderful argument in the 'Origin of Species,' he finds that Darwin records the facts and seeks an explanation for them in the doctrine of "natural selection." In the modern literature the method seems somewhat reversed, "natural selection" being taken as the fact, and the details of animal life as its evidence. There may be little intrinsic difference in the two positions, but the first requires argument, whilst the second relies on evidence too little submitted to cross-examination. Throughout the volume we are noticing this latter position is very pronounced, and we watch the natural transition of theories into dogmas.

The chapter on "Instinct and Reason" is one among the many interesting subjects discussed in this suggestive book, and here the argument enters the psychological arena. Our authors define instinct as "automatic obedience to the demands of external conditions," and state that it "differs from other allied forms of response to external conditions in being hereditary, continuous from generation to generation." But though it is stated "this sufficiently distinguishes it from reason," we are told that the line between the two "cannot be sharply drawn." This rather minimises the subsequent complaint that the "confusion of highly perfected instinct with intellect is very common in popular discussions."

The pages are always interesting, and very many are beautifully illustrated; but the figure of the *Kallima* butterfly given in support of "mimicry" is of an "hereditary" character, still showing the insect with the head uppermost on the twig, despite the many recent corrections that have appeared to the effect that the butterfly when at rest has head downwards.

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*A Synopsis of the Mammals of North America and the adjacent Seas.* By DANIEL GIRAUD ELLIOT, F.R.S.E., &c. Field Columbian Museum, Publication 45. Chicago, U.S.A.

THIS is a most valuable synopsis of the Mammals of North America, but the knowledge and industry displayed seem to be in an inverse ratio to the strength of purpose in the author. Mr. Elliot recognizes the plethora of proposed species in his fauna: "A considerable number of the so-called species and subspecies contained in this volume will eventually swell the list of synonyms already sufficiently formidable." He further makes the remark that in late years there is an inclination to unduly separate in a specific sense "at the risk of reducing the science to one founded on labels and localities, instead of distinctive and prominent characters." He clearly states that "there is hardly a genus of North American mammals that does not contain too many named forms," but decides that the present time cannot be supposed "as opportune for a final and satisfactory revision." We regret this decision: either the criticism need not have been made, or it should have been pressed home by the author's revision. In the purely artificial canons of nomenclature, where the greatest liberty—if not licence—is observed, it requires no more courage to dethrone than to elect in a process that Mr. Elliot recognizes as largely one of names. One statement deserves special attention, as presumably applied to species not described on outside colouration, or non-essential measurements, but absolutely founded on cranial characters, and that is that these are subject to a large element of error, for "the lack of resemblances often observed among crania is frequently but the individual variations of a type." In this work crania are mostly, if not entirely, figured so that the caution becomes authoritative.

There can be little doubt that this synopsis of the Mammals of North America will for some time hold the field; it is, like all



American biological publications, lavishly illustrated, the figures being entirely of an osseous character. But we still wish that the author had, and we shall continue to hope that he will, in the light of his strictures, publish a revision, and give evidence of the faith that is within him.

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*Our Country's Shells, and how to know them ; a Guide to the British Mollusca.* By W. J. GORDON. Simpkin, Marshall & Co., Ltd.

OUR country's shells and how to name them is really the aim of this little book. A knowledge of the British Mollusca is something quite distinct, being related to the animal, and not only to his dwelling place. However, everything comes in time ; first a collection of shells, and then a desire to know something of their inhabitants. As an aid to recognize species, this compilation by Mr. Gordon is admirable, and is the main end of a profusely illustrated brochure. Few will probably read the classificatory chapters, but Chapter V., in its introductory paragraphs, has the charm of real natural history. "We grow in knowledge as we grow in years" ; but oh to be a boy again, with an inexpensive book like this in our pocket, and all the seashore before us ! Thirty-three chromo-lithographic plates are said to illustrate every British species.

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*Taxidermy : comprising the Skinning, Stuffing, and Mounting of Birds, Mammals, and Fish.* Edited by PAUL N. HASLUCK. Cassell and Company, Limited.

IN his preface to this small and very inexpensive publication, Mr. Hasluck informs us that "This Handbook contains, in a form convenient for everyday use, a comprehensive digest of the knowledge of Taxidermy, scattered over nearly twenty thousand columns of 'Work,' a weekly journal, and that the information was originally contributed by Mr. J. Fielding-Cottrill." It is certainly one of the simplest little books on the subject which we have seen, and the information is imparted in a concise and easily understood way. It also contains a chapter on "Preserving, Cleaning, and Dyeing Skins," and another on "Preserving Insects and Birds' Eggs." One of the best injunctions in the work is—"Beginners are advised not to purchase the 'boxes of bird-stuffing tools' as advertised, or they may find half of the tools useless, and the other half unnecessary."

EDITORIAL GLEANINGS.

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At the Meeting of the Zoological Society, held on June 18th, the interesting mammalian discoveries recently made by Sir H. H. Johnston were discussed. A communication was read from Prof. Ray Lankester on the new African mammal lately discovered by Sir Harry Johnston in the forest on the borders of the Congo Free State, of which two skulls and a skin were exhibited. Prof. Lankester fully agreed with Sir Harry as to this mammal belonging to a quite new and most remarkable form allied to the Giraffes, but having some relations to the extinct *Helladotherium*, and proposed for it the generic name *Okapia*, from its native name "Okapi." The scientific name of this mammal would therefore be *Okapia johnstoni*, Mr. Sclater having already given it a specific name based on the pieces of its skin previously received. Sir Harry Johnston, who was himself present, gave an account of the facts connected with his discovery of this animal. Sir Harry also stated that during his last excursion to the north of Mount Elgon he had found large herds of a Giraffe in this country which appeared to be distinct from previously known forms of this mammal in having five bony protuberances on the head, four placed in pairs, and one anterior in the middle line. Four examples of this animal were now on their way home, and would soon be here to settle the validity of this presumed new species.

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At a Meeting of the Linnean Society of New South Wales, held on April 24th last, Mr. Coleman Phillips, a visitor, addressed the meeting on the subject of Rabbit extermination. The speaker, a resident of South Wairarapa, New Zealand, explained that in his district Rabbits are successfully kept in check by the operation of introduced natural enemies (Ferrets, Stoats, and Weasels), and the spread of diseases (bladder-worm, liver-rot, scab, and lice). Trapping, fumigation with bisulphide of carbon, and reliance solely upon poisoning or wire-netting, he considered to be methods altogether wrong in principle. He advocated in preference those which had been successfully tried in New Zealand; and at the same time he expressed his astonishment that in Australia anything like organized effort of the right kind in dealing with so important a matter seemed conspicuously absent.

ALL who have been in any way connected with our excellent contemporary, the 'Annals and Magazine of Natural History,' will probably have been brought in contact with Mr. Alfred Whitehouse, whose recent death we greatly regret. Mr. Whitehouse, at the time of his decease, was fifty-five years of age, and had been with the well-known firm of Taylor and Francis for forty-one years.

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MOST students of evolution will remember, and probably possess, a small volume entitled 'Darwinism and other Essays,' by John Fiske, M.A., &c., published in 1879. It was with great regret that we read in the 'Times' of July 6th a notice of the death of the author. From that notice we learn that Mr. Fiske died on the 4th inst. of heat apoplexy at Gloucester, Massachusetts. He was born in 1842, and his original name was Edmund Fiske Greene, but he subsequently adopted the name of his great-grandfather, John Fiske.

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THE Syndics of the Cambridge University Press have undertaken the publication of an important work on the Fauna and Geography of the Maldive and Laccadive Archipelagoes. This work comprises the results of the first scientific expedition that has visited the Maldives and Laccadives. These groups, over 1000 miles long by 70 broad, and comprising about 1500 islands, were surveyed by Capt. Moresby in 1834, at a time when the natives were still unfriendly. Beyond the published charts there is no detailed information respecting them. The expedition, consisting of Mr. J. Stanley Gardiner, Mr. L. A. Borradaile (Selwyn College), and Mr. C. Forster Cooper (Trinity College), passed eleven months in the two groups, during which an attempt was made to survey the area as thoroughly as possible. The chief object of the expedition was to investigate the interdependence of the physical and biological factors in the formation of atolls and reefs. To this end upwards of three hundred dredgings were taken, a large number of soundings were run, and every group of organisms was carefully collected. As a type atoll, Minikoi was chosen on account of its isolation, almost midway between the main reefs of the two groups. The three months, June to September, of the south-west monsoon were spent here. In the Maldives the land and reef fauna of Hulule atoll was collected for comparison with Minikoi. For the rest, eleven out of seventeen atolls were visited, including about two hundred islands, in a cruise of five months' duration, on a schooner and boats lent by the Sultan. Later a steamer was chartered from Ceylon, and four other atolls, including Suva-diva and Addu, were dredged and surveyed. The work will be published in eight parts, of which the first will appear in October, 1901.

FROM Cambridge we have received the Thirty-fifth Annual Report of the Museums and Lecture Rooms Syndicate. Zoological science is not neglected at Cambridge, and the additions to the collections there seem most important and somewhat prodigious. We have already referred to Mr. Gardiner's expedition to the Maldivé and Laccadive Archipelagoes. The collections made by the Skeat expedition to the Malay Peninsula are still being worked out by specialists. Amongst other acquisitions, we read that the collection of specimens dredged by the Royal Indian Survey Ship 'Investigator,' many of them belonging to the deep-sea fauna, is a most valuable addition, for which the special thanks of the Museum are due to the Indian Museum at Calcutta. Dr. Haddon's collection of Actiniaria is a gift the value of which is largely increased by the fact that much of his published work refers to this group of animals. Mr. Budgett's second visit to the Gambia was most successful. He returned to Cambridge in the autumn with some remarkable Teleostean embryos, a complete set of *Protopterus* embryos, and a larva of *Polypterus*, all of which are obtained for the first time.

It is with great sorrow that the Superintendent records the death of F. P. Bedford, B.A., scholar of King's College, on Oct. 7th, 1900. He had recently returned from a zoological expedition to Singapore, and some of his collections have been presented to the Museum. A cabinet for the reception of the skins of birds has been given to the Museum by Mrs. Bedford, in memory of her son's interest in zoology.

